

Honeywell

W7620 SINGLE ZONE CONTROL SYSTEM PROVIDES CUSTOMIZED CONTROL OF HVAC SINGLE ZONE EQUIPMENT. SPECIFIC FEATURES THIS SYSTEM OFFERS INCLUDE: COMMUNICATION, APPLICATION FLEXIBILITY, DIRECT DIGITAL CONTROL, EASY INSTALLATION AND PROGRAMMING, AND INCREASED EQUIPMENT RELIABILITY.

- W7620 Base Controller provides:
 - four relay outputs
 - network communication
 - T7660 Space Temperature Sensor inputs

- W7621 Expansion Input Point Boards provide additional input point expansion on one board of up to:
 - two resistive inputs
 - two digital inputs
 - two voltage inputs (one dry contact, one extended 24 Vac input)

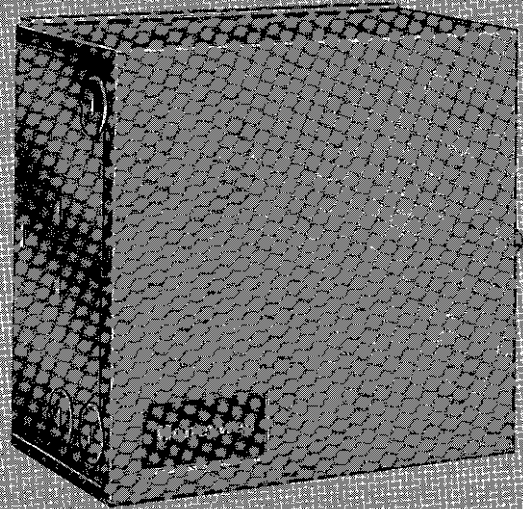
- W7622 Expansion Output Point Boards provide additional output point expansion on one board of up to:
 - three analog outputs
 - three digital outputs

- T7660 Space Temperature Sensor provides up to:
 - one space temperature input
 - one space temperature & point
 - one override push button/LED indication

- CI Up to four heat/four cool conventional or four-compressor heat pump

- Flexible control options:
 - analog/humidity switch
 - packaged or integrated economizer
 - indoor air quality switches

SINGLE ZONE AND WATER SOURCE HEAT PUMP CONTROL



W7620

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ORDERING INFORMATION

WHEN PURCHASING REPLACEMENT AND MODERNIZATION PRODUCTS FROM YOUR AUTHORIZED SYSTEMS DISTRIBUTOR, REFER TO TRADELINE CATALOG OR PRICE SHEETS FOR COMPLETE ORDERING NUMBER.

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SYSTEM DESCRIPTION

The W7620 Single Zone Control System is Honeywell's new line of single zone control products. The W7620, can conveniently monitor and control individual HVAC zone equipment.

System features include CNAP (Control Network Automation Protocol) communication, application flexibility, DDC (Direct Digital Control), network integration, easy installation and programming, and increased equipment reliability.

The basic W7620 Single Zone Controller has built-in capability to process I/O (Input/Output) data, run DDC programs, and communicate along with other devices on the CNAP network. See W7620 family photo.

The W7620 Single Zone Controller is a DDC device. DDC has a control loop which periodically updates the outputs as a function of a set of measured inputs and a given set of algorithms. The advantages of DDC are:

Control

The W7620 Single Zone Controller provides sophisticated control loops for accurate control of single zone equipment that prevents temperature droop and provides greater comfort in the zone.

Maintainability

Use of a single programmed computer reduces requirements for calibration checks because there are fewer interconnected analog components. Periodic recalibration is automatically performed.

Reliability

EEPROM (Electrically Erasable Programmable Read Only Memory) and EPROM (Erasable Programmable Read Only Memory) hold the control program and parameters eliminating the need for a battery.

Communication

Networking controllers together on a RS-485 network using CNAP software provides information for integration of control functions, monitoring, trending, alarming, and report generation.

The W7620 Single Zone Controller can be applied in a stand-alone environment with distributed zone control and hard-wired time-of-day functionality. It can also be applied as part of a networked system via connection to

the RS-485 CNAP network. The CNAP network enables communication to multiple W7620 Zone Controllers as well as to other controllers, such as the W7600 Control Module, 47640 NIU or a Q7650 PC Interface Card in a PC with ZM7603 Remote Monitoring software. Refer to the ZM7601 Configuration Tool/ZM7603 Remote Monitoring software specification sheet, Form 63-4272, for a more detailed description.

Through the CNAP network, the controller can be provided with information specific to its controlled zone only, or with information necessary for a group of zone controllers. ZM7601/ZM7603 software can, in turn, be provided with periodic information on any controller data for monitoring, data gathering, or report generating. See Figure 1.

Applications Overview

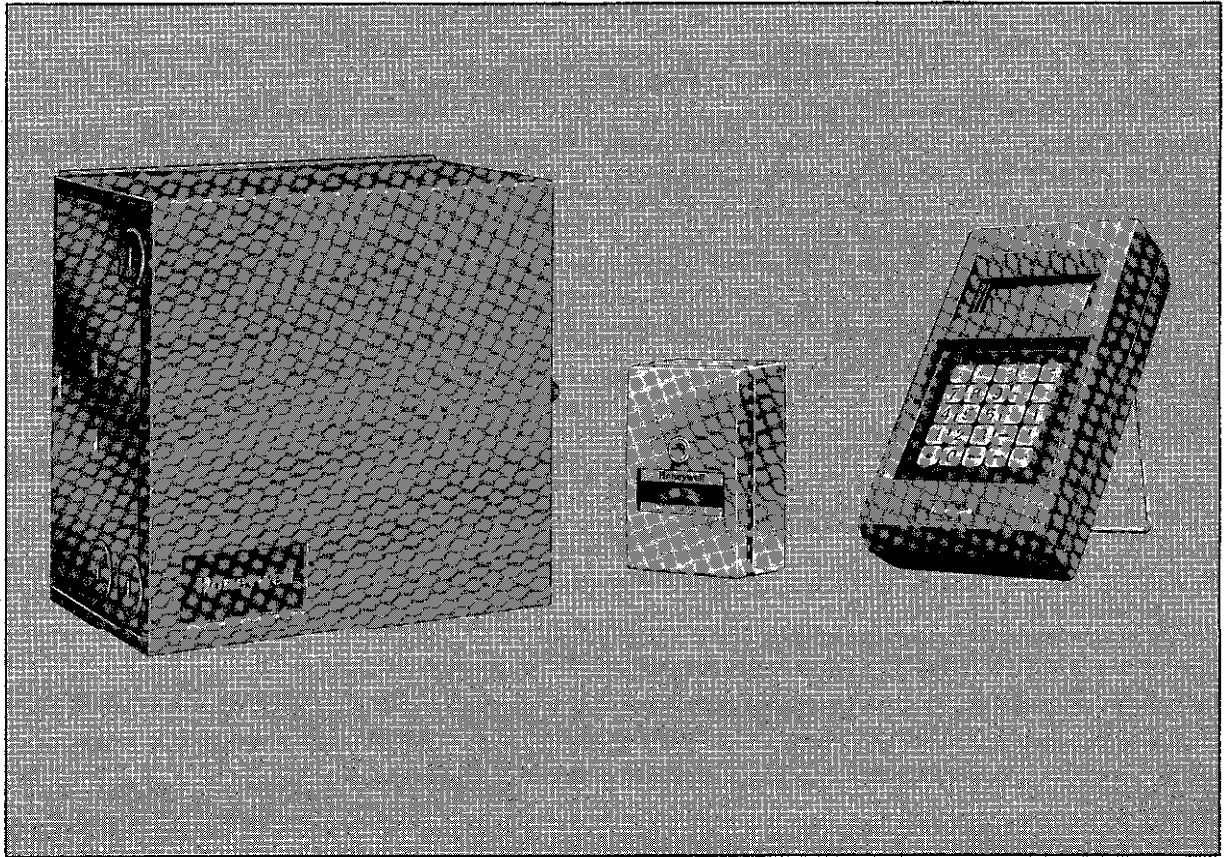
The W7620 Zone Control System was designed for application flexibility. Simply by changing the algorithm which is stored in EBPROM and by determining the input and output requirements, the same **W7620 controller can** be applied in a variety of applications.

W7620 Baseboard

The W7620 Baseboard provides input dedicated to the T7660 Space Temperature Sensor (space temperature, remote setpoint, bypass switch with LED feedback, and CNAP communication connections). The baseboard only provides four SPST (Single Pole, Single Throw) relays. A variety of small point, single zone or heat pump applications can be met by using only the W7620.

W7621 Expansion Input Board

The W7621 Input Board adds two resistive, one digital, one AC input, and two voltage inputs that can be used for a variety of inputs depending on application. One W7621 input board can be added to the W7620 Zone controller.



Family of W7620 Components

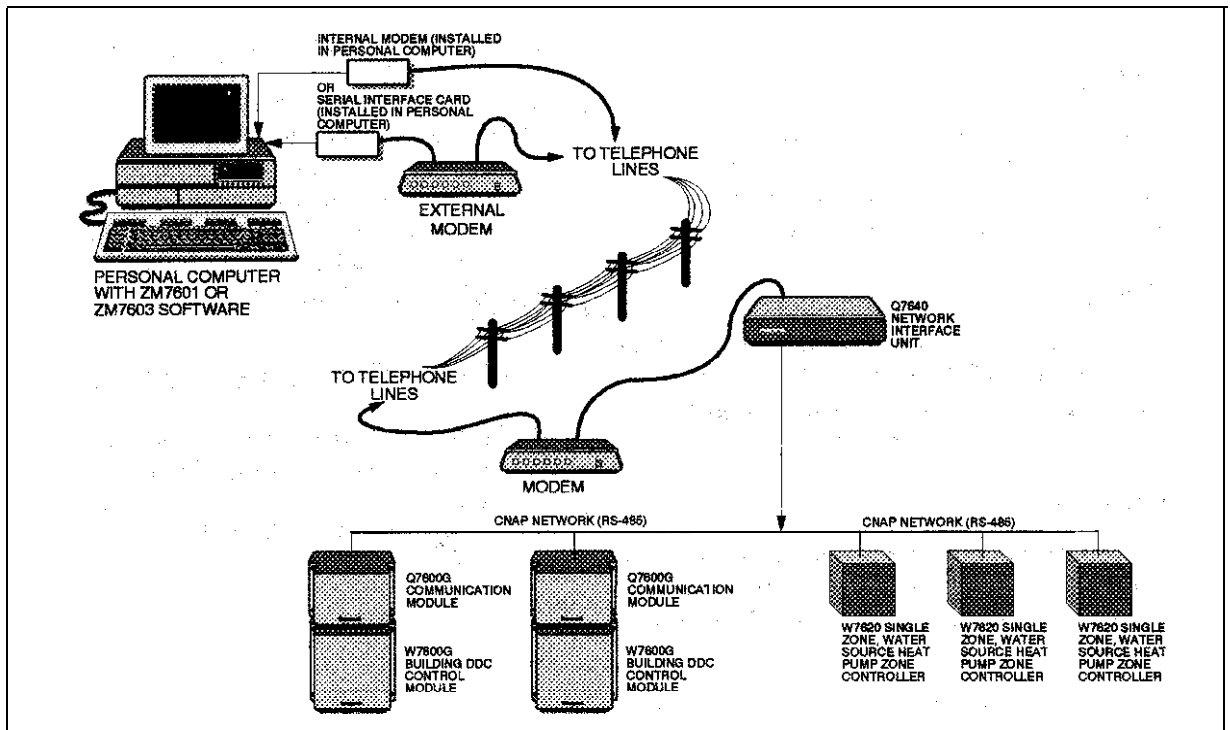


Figure 1 – CNAP Network Diagram

W7622 Expansion Output Board

The W7622 output board has a selection of outputs depending on the model number. One output board of any type can be added to the W7620 Zone Controller.

The W7622 drives any output (for heat, cool, etc.), either digital or analog. Function depends upon application. The relay outputs have both normally open and normally closed contacts. The analog outputs are 0-10 Vdc.

T7660 Zone Temperature Sensor

The T7660 is a platinum RTD (Resistive Temperature Device) that is placed in the zone for temperature readings. Sensors are available with or without an integral setpoint adjustment dial or an occupant override push button with status LED (Figure 2). The push button allows setting the heating or cooling system to an occupied mode when the control system is in an unoccupied mode. Also, it can be used to initiate a continuous unoccupied period. The LED indicates the override status. These zone sensors are furnished with an RJ11 connector for local operation of an S7610 POT (Portable Operator's Terminal). (See the T7660A-D Space Temperature Sensors Information and Installation sheet, Form 63-4219, for more details.)

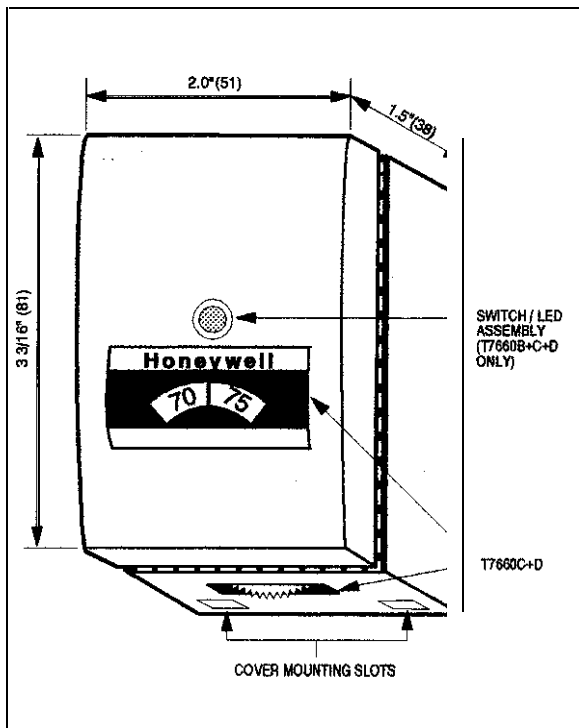


Figure 2 - T7660 Sensor

S7610 POT (Portable Operator's Terminal)

The S7610 POT is a hand-held device that provides a means to set, test, and monitor point and parameter values.

The POT utilizes the RS-485 CNAP network for communication and connects to the controller through a cable to an RJ11 jack at the T7660 Zone Temperature Sensor, or to an RJ11 jack inside the controller case. The POT can communicate to any controller on the network. See the S7610 Zone Control POT Guide, Form 63-4225, for information on operation. See Figure 3.

NOTE

The POT cannot communicate with W7620 Zone Controllers that are more than two repeaters away.

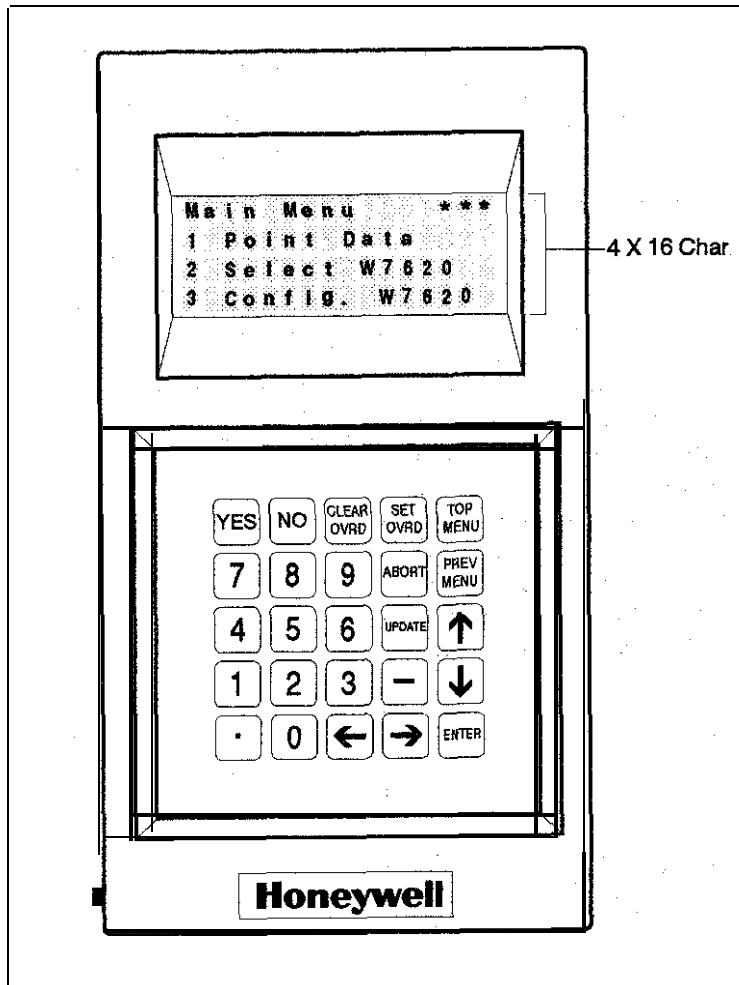


Figure 3 -POT (Portable Operator's Terminal)

INSTALLATION

When installing this product . . .

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the SPECIFICATION:5 section and on the product to make sure that the product is suitable for the application.
3. The installer must be a trained, experienced service or installation technician.
4. After installation is complete, check system operation as provided in these instructions.
5. Verify that the W7620s are installed in accordance with the job drawings and these installation procedures.
6. Verify that the T7660 Space Temperature Sensor is installed in accordance with job drawings and the T7660 Specification Sheet (63-4219).

CAUTION

Disconnect power supply before beginning installation to prevent electrical shock and equipment damage.

CAUTION

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instruction manual, it may cause interference to radio communications. Pursuant to FCC Rules, Subpart J of Part 15, this equipment has been tested and found to comply with the limits for a Class A computing device. These limits are designed to provide reasonable protection against interference when operating in a commercial environment. Operating this equipment in a residential environment is likely to cause interference, in which case the user at his own expense will be required to take whatever measures necessary to correct the interference.

CAUTION

Discharge static electricity by touching a metal surface-before removing the W7621 or W7622 expansion board from the antistatic bag. Failure to do so might damage the board.

Mounting

Mount the controller in a location that allows clearance for wiring, servicing and removal of the cover.

1. Remove the cover by loosening the two side screws (Figure 4) and mount the controller in a location appropriate to the equipment being controlled.
2. Use No. 8 sheet metal screws (obtain locally) to secure the controller to the mounting surface through the four key holes inside the case.
3. Test the controller and equipment operation.
4. Replace and secure the controller cover after wiring is complete.

Mounting Additional Boards

To install additional input or output expansion boards (W7621 or W7622) which are not manufacturer installed on the base board assembly (Figure 5) complete the following:

1. Align the IO-pin connector (J4) or (J5) on the baseboard with the 10-pin inverse connector on the input board (J15) or output board (13).
2. Align the white plastic standoff tab with the hole located near the IO-pin connector.
3. Lean the input or output board in at the base to catch the metal tab located on the bottom of the controller.
4. Snap the board into place
5. Secure the board into place by applying and tightening the two board screws provided with each expansion board.

If securing screws are not used, the expansion board will not be grounded. This will result in improper operation or damage to the device.

Wiring

NOTE

All wiring must conform to local codes and ordinances. The green ground screw outside the controller case must be connected to a verified earth-ground.

The W7620 Single Zone Application Guide, Form 63-4220, provides information on corresponding terminal designations to function connections. Verify that the wiring was done according to the wiring diagram provided and the J/O Control Function Cross-Reference provided on the inside cover of the W7620.

Wire as follows:

1. strip $\frac{3}{16}$ inch (5 mm) insulation from the conductor.
2. Insert the wire in the required terminal location and tighten screw terminal.

Figure 6 illustrates the terminal arrangement in the controller. All controller models are furnished with a terminal arrangement similar to that shown in this figure.

Communication

Pull the pair of CNAP communication cables to each controller on the network and connect to the screw terminals marked CNAP +/- (Figure 6).

NOTE

When this wiring is removed, connect positive to positive wires and negative to negative wires to allow communication signal to continue down the network.

Power

Power Wire Lengths

1. Power requirements limit 24 Vac power transmission distance. The following data can be used in calculating load versus wire length:

Device	V	A
W7620		3.9
output relay		0.5
Analog output		0.6
Power relay	4-10	

2. The power relay load rating depends on the relay used. Power relays can be wired to draw coil current from separate 24 Vac supply.
3. The operating voltage range for the W7620 is 20 to 30 Vac.

Power Connection

Pull a pair of 24 Vac power cables from either an isolated or shared transformer to each controller on the network ml connect to Terminals TR and TR earth-ground.

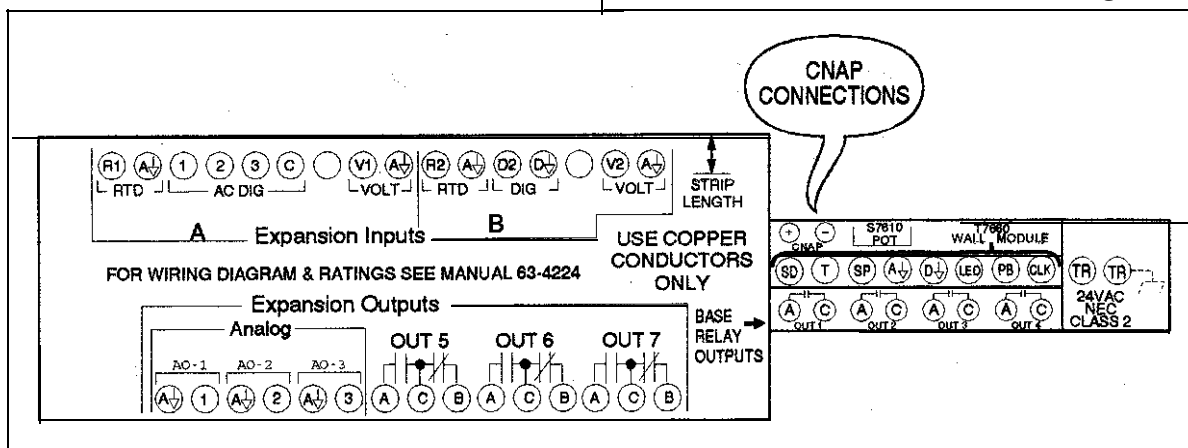


Figure 6 -Terminal Designation Label

T and AI). See the T7660 Space Temperature Sensor specification sheet, Form 63-4219, for the correct temperature to **measure** resistance value cross-reference.

NOTE

The sensor must be disconnected from the W7620 before reading its resistance value with an ohm meter.

4. If long sensor wiring is used, **measure** resistance supplied to the W7620 by both the temperature sensor and the leadwire for greater accuracy.

Output Point Test Procedures

Testing outputs consists of observing the analog or digital output states of physical points to see that the value or state is comparable to the point value as displayed on the S7610 POT or ZM7601/ZM7603 software. These devices can be used to override the output point to a known state to facilitate checkout. Use the following procedures:

1. Set the override on an output point to a desired value with the S7610 POT or ZM7601/ZM7603 software.
2. *Measure or observe the output condition (e.g., fan turns on).*
3. If the output does not follow the *command* override condition, isolate the problem by checking connections and measurements at the output destination as well as at the W7620.
4. Clear the override condition.

Example:

The following procedure is for Fan (can be *any one of the outputs, 1-7*, depending on output options **selected**, see W7620 Single Zone/WSHP *Application Guide, Form 63-4220*).

1. Display Fan (OUT.) on the S7610 POT or ZM7601/03 software.
2. Set into override the point to the desired state, ON or OFF.

3. Observe the fan or measure the output. If the expected result is not achieved, measure the resistance across the correct **terminals** (e.g., OUT1 A and C). The resistance should hold at **approximately 1.0** when the output is ON.

CHECKOUT

The following steps for complete checkout and testing of a W7620 are described fully below. The procedures are as follows:

1. Check W7620 installation and wiring, including power to the W7620.
2. Start-up W7620 (connect S7610 POT or ZM7601/ZM7603 software) and assign a network node address and application (even when using device in a nonnetworked application). Refer to W7620 Application Manual, Form 63-4220.
3. Test analog and digital input points
4. Test analog and digital output points.
5. Verify parameter point values.

Installation and Wiring

1. Verify that the connections between the W7620 and peripheral equipment are secure.
2. Verify that grounding is correct in accordance with **GROUNDING** in this guide as follows:
 - a. Verify that each W7620 case is grounded when the W7620s are powered from individual transformers.
 - b. Verify that all W7620 cases are grounded when the W7620s are powered from a c - o n transformer.
 - c. Verify that if the application calls for grounded transformer secondaries, that the grounded side is connected to earth-ground on the W7620 (TR earth-ground).
 - d. Verify that neither of the CNAP network wires is grounded or connected to the 24 Vac wires.
 - e. Verify that the polarization of the CNAP network wires is correct, positive to positive and negative to negative in all cases.
3. Verify the CNAP network termination and biasing resistors are installed in accordance with 47640 Network Interface Unit specification sheet (63-4290).
4. Turn on power and verify that each W7620 has at least 20 Vac at Terminals TR and TR earth-ground.

Physical Points

Testing physical points requires either the actual sensor be at a known **value** or digital state, or that a simulated known value or digital state be applied to the input point terminals. In the case of physical output points, the output condition of the controlled equipment must be known, or the output terminals of the W7620 can be measured with an indicating device or meter. The Hardware Configuration Data table shows all of the possible physical points with terminal designation and use. The General Guide for Input/Output Point Testing table can be used to determine what can be used to provide inputs and what to use to **measure** outputs.

Test Analog and Digital Input and Output Points

Input Point Test Procedures

1. Read point value through the S7610 POT or the ZM7601/ZM7603 software to verify approximate analog value or digital state. If the data is acceptable, proceed to the next point.
2. For analog points that display FA (sensor failure) next to the engineering unit:
 - a. Provide a known measurable value to the input.
 - b. Compare the input point value displayed on the POT or ZM7601/ZM7603 software with the known value.
 - c. **If** the difference between the two values exceeds the acceptable range, isolate the problem by taking a measurement at the input source, the conductors (e.g., cable, wire), and the W7620.

Example:

The following is the procedure for input Point 1 (SPACE TEMP).

1. Measure the input space temperature in degrees Fahrenheit with another source, such as a thermometer, near the actual sensor.
2. **Verify** that the S7610 POT or the ZM7601/ZM7603 software value reads the expected temperature.
3. If the accuracy of the measurement is in question, measure resistance supplied by the sensor at the Space Sensor itself to find sensed value Terminal

CAUTION

1. Power must be OFF prior to connection to or removing connections from Terminals TR and TR earth-ground.
2. To disable a controller, remove both legs of the AC power. Removing only one leg may prevent other controllers on the same transformer from communicating on the CNAP network.

Grounding

The W7620 Zone Control System must be earth-grounded at each cluster of W7620 controllers (one or more W7620 controllers powered by a single 24 Vac transformer). Use No. 18 AWG or larger copper conductor run to a known earth-ground, such as a water pipe driven into the earth or the ground connection found within the power distribution panel. The power distribution panel must be earth-grounded per National Electric Codes. Do not use the ductwork or the wiring conduit since these do not necessarily provide a good ground. The following provides grounding details:

1. Earth-ground one W7620 within a group of W7620s connected to a given transformer.

Connect the ground wire to the green ground screw on the W7620 chassis. See Figure 7.

CAUTION

Keep the phasing of the transformer secondary consistent from W7620 to W7620. That is, connect the same side of the transformer secondary to the same terminal number on each W7620.

2. Grounded Transformer Secondaries: If the Transformer has a grounded secondary, it is necessary to identify the grounded side. Use an ohm meter to test for conductivity between one side of the transformer and the suspected grounding plane (usually the controller chassis). If one side of the transformer is grounded, connect the grounded secondary to the earth-ground connection on the W7620 (TR earth-ground).

CAUTION

Failure to connect grounded secondary to earth-ground will cause damage to the transformer.

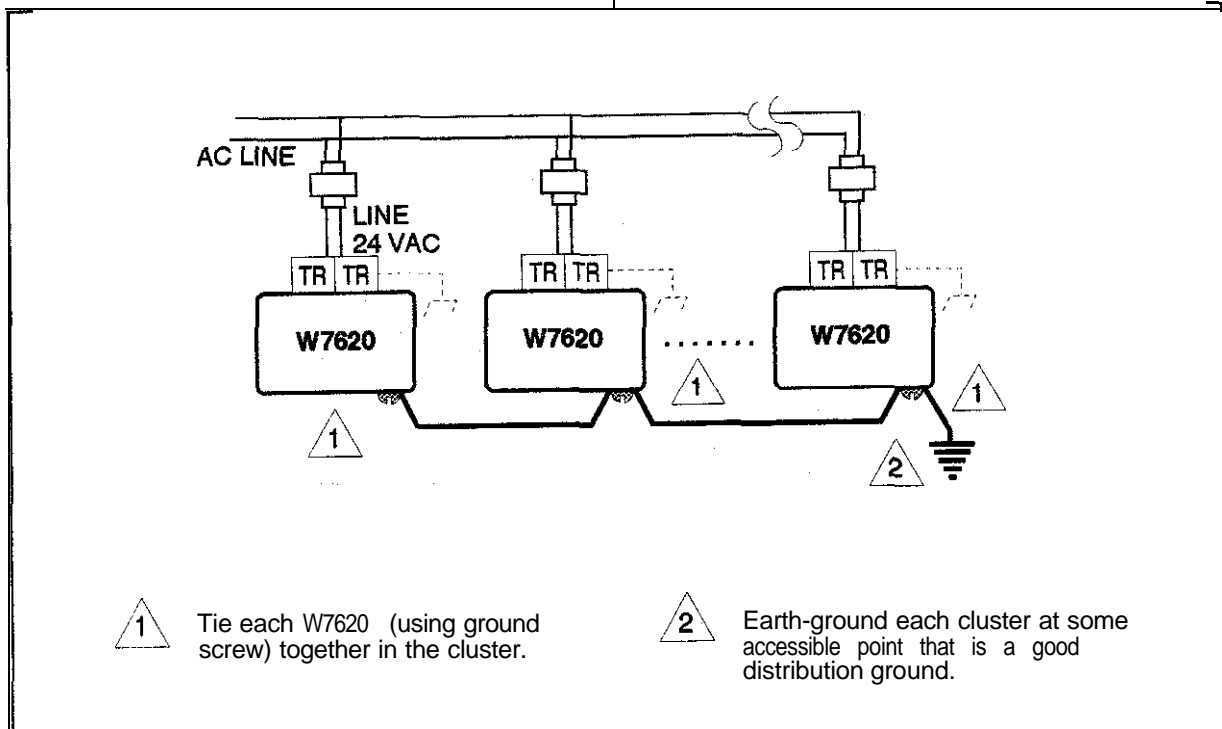


Figure 7 – Ground Using Separate Transformers (No Local Ground)

SPECIFICATIONS

Electrical Ratings

Supply Voltage	20-30 Vac, 50 or 60 HZ
System Current Draw	8.5 VA maximum at 30 Vac, 50 or 60 Hz
Inputs:	
Resistive	29104370 ohm (-40 to 265°F temperature range with platinum sensors)
Voltage	0-10 Vdc with 2 Vdc overrange
Digital	External contact (switch, relay or transistor) Into 15 Vdc, 15 mA circuit
AC Input	Up to three 24 Vac source indicating digital response to call from same transformer, All three Inputs can be used separately or together to determine the final state of input.
Outputs:	
Analog	0-10 Vdc, 20 mA maximum
Relay (expansion)	2.0 amp maximum running, 7.5 amp In-rush at 30 Vac, 50 or 60 Hz
Relay (base)	1.6 amp maximum running, 7.5 amp In-rush at 30 Vac, 50 or 60 Hz

Temperature Ratings

Ambient	40 to 110°F [4 to 44°C]
Shipping	-40 to 150°F [-40 to 65°]

Humidity Rating

5-95% RH, noncondensing

Mounting Requirements

W7620 Mount on any surface using anchoring screws (not provided where electrical, temperature, and humidity ratings can be observed).

Dimensions

See Figure 8.

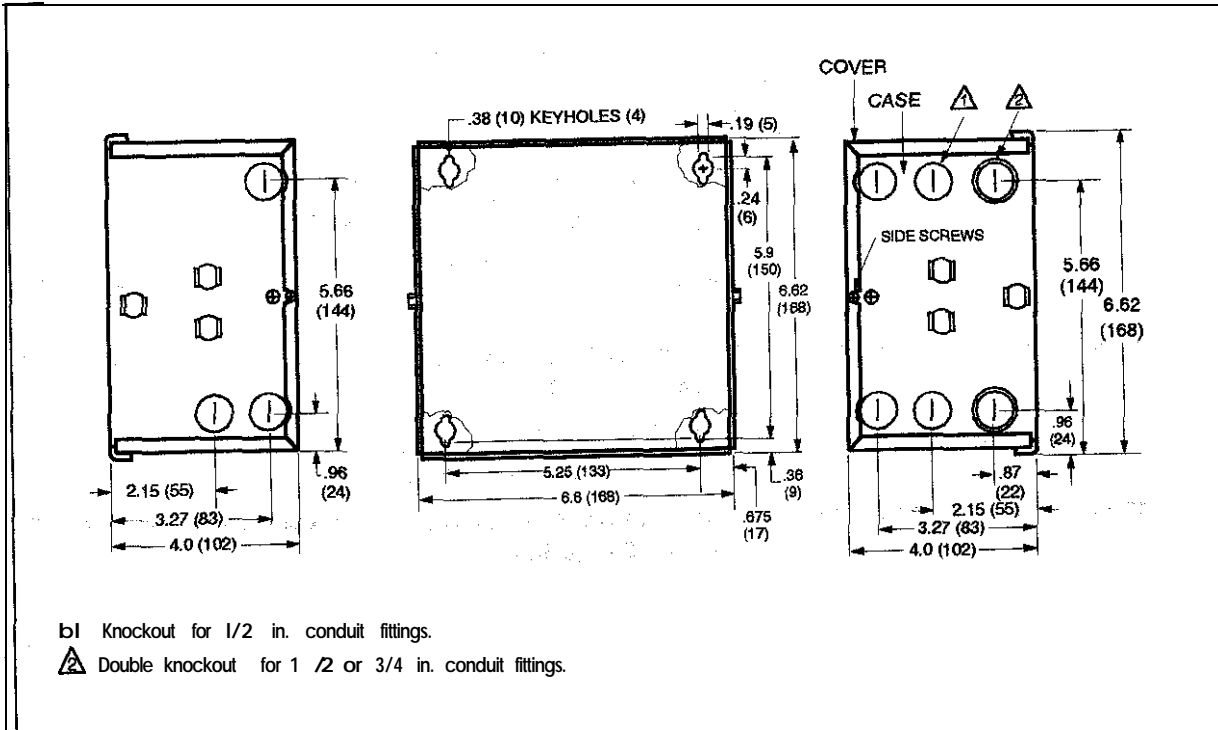


Figure 8 - W7620 Dimensions

ACCESSORIES

Description	Model Number	Includes
Base Unit (with cover)	W7620D1009	Zone control, W7621F1003, W7622E1004
	W7620D1017	Zone control, W7621F1003
	W7620D1025	Zone control, W7622E1004
	W7620D1033	Zone control only
Base Unit (without cover)	W7620E1006	Zone control, W7621F1003, W7622E1004
	W7620E1014	Zone control, W7621F1003
	W7620E1022	Zone control, W7622E1004
	W7620E1030	Zone control only
Input Expansion Boards	W7621F1003	2 resistive, 2 voltage, 1 digital, 1 occ/unocc toggle input
	W7621F1011	2 resistive, 2 voltage, 2 digital inputs
Output Expansion Point Board	W7622E1004	3 relay, 3 voltage outputs
	W7622E1012	3 relay outputs
	W7622E1020	3 voltage outputs
Sensor and Accessories	T7660A1009	Space temperature sensor network communication port
	T7660B1007	Space temperature sensor network communication port, override button
	T7660C1005	Space temperature sensor network communication port, override button, setpoint potentiometer
	T7660D1003	Configurable sensor, override button, setpoint potentiometer
	230514	Adaptor plate
	230515	Finish plate, black color
	230516	Finish plate, beige color
	230517	Black mounting ring
	230518	Splatter ring
Other Sensor Options		
Description	Model Number	Application
Averaging Sensor	C7100A1015	Discharge, return, or mixed air temperature sensing
Space Temperature Sensor	C7130A1001	Alternative to T7660A without communication
Humidity Sensor	C7600B1000	Humidity input 2-10 volts
Other Options		
Damper Actuator	M7415	Use with W7459 Economizer Logic Module, modulating spring action
Economizer Logic Module	W7459	Economizer actuator control
Enthalpy Sensor	C7400	Use with W7459 Logic Module, solid-state
Switching Relay	R8222	For switching external equipment
Valve Actuator	ML784	2-10 volt hot/cold water modulating control
Damper Actuator	ML7161	Direct coupled 2-10 volt damper actuator
	M945	Modutrol motor, requires proper resistors
	M955	Super modutrol motor, requires proper resistors
	M975	Modutrol motor, requires proper resistors
	M7285	Mod. IV motor

Canadian EMI

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio **Interference** Regulations Of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

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